

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Amended) A method of operating a plasma fuel reformer having a first electrode and second electrode spaced apart from the first electrode, the method comprising the steps of:

generating a plasma arc between the first and second electrodes,
advancing a first air/fuel mixture having a first air-to-fuel ratio into the plasma arc,
determining if a soot purge of the plasma fuel reformer is to be performed and generating a purge-soot signal in response thereto, and
advancing a second air/fuel mixture having a second air-to-fuel ratio into the plasma arc in response to generation of the purge-soot signal, wherein the second air-to-fuel ratio is greater than the first air-to-fuel ratio.

2. (Previously Amended) The method of 1, wherein the determining step comprises a step of sensing the amount of soot within the plasma fuel reformer.

3. (Previously Amended) The method of claim 2, wherein the sensing step includes the step of generating a soot accumulation control signal when the amount of soot within the plasma fuel reformer reaches a predetermined accumulation level, and wherein the step of advancing the second air/fuel mixture includes advancing the second air/fuel mixture in response to generation of the soot accumulation control signal.

4. (Previously Amended) The method of claim 1, wherein the step of advancing the second air/fuel mixture includes advancing the second air/fuel mixture for a predetermined period of time to purge the plasma fuel reformer of soot.

5. (Original) The method of claim 1, wherein the second air/fuel mixture is substantially devoid of fuel.

6. (Original) The method of claim 1, wherein the second air/fuel mixture is devoid of fuel.

7. (Previously Amended) The method of claim 1, wherein the determining step comprises determining if a predetermined period of time has elapsed since the plasma fuel reformer was last purged of soot and generating a time-lapsed control signal in response thereto, and the step of advancing the second air/fuel mixture comprises advancing the second air/fuel mixture in response to generation of the time-lapsed control signal.

8. (Previously Amended) The method of claim 1, further comprising the step of advancing a third air/fuel mixture having the first air-to-fuel ratio into the plasma arc subsequent to the step of advancing the second air/fuel mixture.

9. (Previously Amended) The method of claim 1, wherein the determining step comprises detecting a plasma fuel reformer shutdown request control signal, and the step of advancing the second air/fuel mixture comprises advancing the second air/fuel mixture in response to detection of the plasma fuel reformer shutdown request control signal.

10. (Previously Amended) The method of claim 1, wherein the determining step comprises generating a high-load control signal when an engine associated with the plasma fuel reformer experiences a high load condition, and the step of advancing the second air/fuel mixture comprises advancing the second air/fuel mixture in response to generation of the high-load control signal.

11.-23. (Canceled)